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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HIROYUKI NAITOU and TAKASHI KARASUDA

Appeal 2009-004954
Application 10/519,407
Technology Center 1700

Decided: ¹July 10, 2009

Before CATHERINE Q. TIMM, LINDA M. GAUDETTE, and
KAREN M. HASTINGS, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision finally rejecting claims 1-15, the only claims pending in the application.² We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

STATEMENT OF THE CASE

The claimed invention is directed to a method of producing a catalyst for use in the production of methacrylic acid. (Spec. 1:5-6.) More specifically, the catalyst is said to provide a high yield of methacrylic acid when used in a process wherein methacrolein is subjected to vapor phase catalytic oxidization with molecular oxygen. (Spec. 3:20-23.) Claim 1, the sole independent claim, is illustrative of the subject matter on appeal, and is reproduced from the Claims Appendix to the Appeal Brief ("App. Br."), filed May 3, 2007:

1. A method of producing a catalyst having a composition of the following formula (1), wherein said catalyst is useful for production of methacrylic acid by subjecting methacrolein to vapor phase catalytic oxidization with molecular oxygen,
said method comprising mixing
100 parts by mass of solution or a slurry (liquid A), containing molybdenum atoms, phosphorous atoms and vanadium atoms, in which the content of ammonium species is 0 to 1.5 mol relative to 12 mol of the molybdenum atoms,
5 to 300 parts by mass of a solution or a slurry (liquid B), containing 6 to 17 of ammonium species relative to 12 mol of the molybdenum atoms contained in the solution A, and
a solution or a slurry (liquid C), containing an element Z,
wherein the liquid B is mixed with the liquid A, the liquid C or a mixture of the liquid A and liquid C over a period of 0.1 to 15 minutes:
$$P_a M_o b V_c C_u d X_e Y_f Z_g O_h \quad (1),$$

² An oral hearing was conducted on July 8, 2009.

wherein P, Mo, V, Cu and O represent phosphorous, molybdenum, vanadium, copper and oxygen, respectively; X represents at least one element selected from the group consisting of antimony, bismuth, arsenic, germanium, zirconium, tellurium, silver, selenium, silicon, tungsten and boron; Y represents at least one element selected from the group consisting of potassium rubidium and cesium; a, b, c, d, e, f, g and h represent an atomic ratio of each element, and when $b=12$, $a=0.5$ to 3, $c=0.01$ to 3, $d=0.01$ to 2, $e=0$ to 3, $f=0$ to 3 and $g=0.01$ to 3, and h represents an atomic ratio of oxygen necessary for satisfying the valence of each of the above-mentioned components.

Appellants request review of the rejection of claims 1-15 under 35 U.S.C. § 103(a) as unpatentable over Naito, US 2000/296336, published Oct. 24, 2000 (as translated³).⁴

ISSUE

Have Appellants shown that the Examiner reversibly erred in rejecting the claims as obvious in view of Naito because the Examiner failed to fully consider Appellants' evidence of non-obviousness with respect to the claimed period for addition of liquid B?

We answer this question in the affirmative.

FINDINGS OF FACT ("FF")

Claim 1 recites a method of producing a catalyst for the production of methacrylic acid which includes mixing together three separate liquids, identified as A, B, and C. At the time of the invention, a method of

³ Citations to Naito are to pages of the translation provided by the Examiner (copy attached).

⁴ In response to arguments presented in the Appeal Brief, the Examiner has withdrawn the rejection of claims 1-15 under 35 U.S.C. § 103(a) as unpatentable over Kasuga, US 6,458,740. (Examiner's Answer ("Ans."), mailed Aug. 22, 2007, 4.)

producing such a catalyst by mixing together solutions A, B, and C was known in the art. (Spec. 1:11-16; Ans. 3-4.) However, according to Appellants, they discovered that “the time for mixing the liquid B with other liquids has a great influence on the performance of the catalyst to be produced and that a catalyst having a particularly high yield of methacrylic acid can be obtained by specifying the mixing time.”⁵ (Spec. 9:18-21; *see also*, App. Br. 4-5 (citing Spec. 9).) The critical mixing time is specified in claim 1 as “a period of 0.1 to 15 minutes” for addition of liquid B to one or both of liquids A and C.

To establish that the claimed mixing time leads to a new, unexpected result, Appellants rely on the data in Table 1 of the Specification⁶. (*See generally*, App. Br. 5-8 (analyzing and explaining the data).) According to Appellants, the criticality of the addition time for liquid B was not previously recognized by the applied-prior art, i.e., Naito. (*Id.* (discussing the Examples and comparative Examples in Naito); *see also*, Naito 11-12 (“The method for mixing solution A with solution B is not limited to a specific one. For example, it is possible to use a method . . . wherein solution A and solution B are simultaneously poured into a container.”).)

The Examiner does not make a specific finding with respect to the addition times of Naito’s liquids A, B, and C. (*See* Ans. 3-4 (noting only that a determination of the optimal amounts of these components would have been a matter of routine experimentation).) The Examiner does not comment

⁵ “Mixing time” is defined as “the time for adding all of the liquid B to other liquids and in the case of mixing by dropping, the time refers to the dropping time and the stirring after dropping is not included.” (Spec. 10:1-3.)

⁶ Table 1 is reproduced in the Evidence Appendix to the Brief.

on the evidence identified and relied upon by Appellants as establishing criticality of the claimed time period of “0.1 to 15 minutes” for addition of liquid B. (*See generally*, Ans. 3-5; Reply Brief (“Rep. Br.”), filed Oct. 18, 2007, 2.) In response to Appellants’ arguments, the Examiner does assert that Appellants’ evidence is not persuasive of nonobviousness because the “comparisons do not appear to be commensurate in scope with the claims under appeal” since the mixing times of both liquids B and C were changed in Example 11 and Comparative Example 4. (Ans. 4-5.)

Appellants assert that Comparative Example 4 corresponds to Naito’s Example 8, and is relied upon for the limited purpose of establishing that Naito fails to disclose or suggest the criticality of Appellants’ claimed mixing time. (Rep. Br. 2 (referencing App. Br. 8).)

PRINCIPLES OF LAW

“[D]iscovery of an optimum value of a variable in a known process is usually obvious.” *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1368 (Fed. Cir. 2007); *see also In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997). Therefore, when patentability is predicated upon a change in a condition of a prior art composition or its method of preparation, the burden is on Appellant to establish with objective evidence that the change is critical, i.e. it leads to a new unexpected result. *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990). After evidence or argument is submitted by the Appellant, patentability is determined on the totality of the record, by a preponderance of evidence with due consideration to persuasiveness of argument. *In re Glaug*, 283 F.3d 1335, 1338 (Fed. Cir. 2002). All evidence of nonobviousness, including data in the specification, must be considered

when assessing patentability. *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995) (citing *In re Margolis*, 785 F.2d 1029, 1031 (Fed. Cir. 1986)).

ANALYSIS

Appellants have persuasively argued that the Examiner failed to consider the entirety of the evidence in concluding that the claimed invention would have been obvious in view of Naito. In particular, it is not clear on this record that the Examiner fully considered the evidence in the Specification relied upon by Appellants to establish that the claimed mixing time provides a new, unexpected result. Accordingly, we cannot sustain the Examiner's rejection of claims 1-15 under 35 U.S.C. § 103(a) as unpatentable over Naito.

CONCLUSION

Appellant has identified reversible error in the Examiner's obviousness determination. The decision of the Examiner rejecting claims 1-15 is reversed.

REVERSED

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